09/380,256

Present Claims

1. (Previously Amended) An electro-optical glazing structure having reflection and transmission modes of operation for selectively reflecting and transmitting electromagnetic radiation, respectively, said electro-optical glazing structure comprising:

an electro-optical glazing panel of laminated construction, having first and second optical states of operation; and

F1 optical state switching means for switching said electro-optical glazing panel to said first optical state of operation in order to induce said electro-optical glazing structure into said reflection mode of operation, and for switching said electro-optical glazing panel to said second optical state of operation in order to induce said electro-optical glazing structure into said transmission mode of operation

wherein said

electro-optical glazing panel comprises:

a first electrically-passive cholesteric liquid crystal (CLC) electromagnetic radiation polarizing panel;

a second electrically-passive CLC electromagnetic radiation polarizing panel; and

an electrically-active π-phase retardation panel interposed between said first and second electrically-passive CLC electromagnetic radiation polarizing panels.

3. (Previously Amended) The electro-optical glazing structure of claim 1, wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels

F2 reflect electromagnetic radiation having a first circularly polarized state when said electro-optical glazing panel is switched to said first optical state of operation,

wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels transmit electromagnetic radiation having a second circularly polarized state when said electro-optical glazing panel is switched to said first optical state of operation; and

wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels reflect or transmit without absorption electromagnetic radiation having either said first state or said second state when said electro-optical glazing panel is switched to said second optical state of operation.

9. The electro-optical glazing structure of claim 1, which further comprises:

a window frame for mounting said electro-optical glazing panel within a house or office building, or aboard a transportation vehicle.

10. The electro-optical glazing structure of claim 9, which further comprises:

a electromagnetic-sensor mounted on said window frame, for sensing electromagnetic conditions;

a battery supply mounted within said window frame, for providing electrical power;

a electromagnetic-powered battery recharger mounted within said window frame, for recharging the battery;

electrical circuitry mounted within said window frame, for producing glazing control voltages for switching said first and second optical states of operation; and

a programmable micro-computer chip mounted within said window frame, for controlling the operation of said battery recharger and said electrical circuitry, and the production of said glazing control voltages as required by a radiation flow control program stored within said programmable microcontroller.

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13. (Previously Amended) A composite electro-optical glazing structure which comprises:

a plurality of said electro-optical glazing structures of claim 1, stacked together as a composite electro-optical structure,

wherein said composite electro-optical structure has more than two said optical states of operation.

17. The electro-optical glazing structure of claim 1, wherein the transmission of the visible portion of the electromagnetic spectrum is controlled and wherein the IR portion of the electromagnetic spectrum is reflected.

28. The electro-optic glazing structure of claim 1, further comprising:

a reflecting layer for reflecting infrared light, wherein the electro-optic glazing structure of claim 1 controls the transmission and reflection of visible light.

29. The electro-optic glazing structure of claim 1, further comprising:

a reflecting layer for reflecting UV light, wherein the electro-optic glazing structure of claim 1 controls the transmission and reflection of visible light.

30. The electro-optic glazing structure of claim 1, further comprising:

a electro-optic glazing structure which controls the transmission and reflection of IR light, wherein the electro-optic glazing structure of claim 1 separately controls the transmission and reflection of visible light.

31. The electro-optic glazing structure of claim 1, further comprising:

a electro-optic glazing structure which controls the transmission and reflection of visible light, wherein the electro-optic glazing structure of claim 1 separately controls the transmission and reflection of IR light.

Please Amend Claim 68

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68. (Twice Amended) An electro-optical glazing structure having total-reflection and total-transparent modes of operation for selectively reflecting and transmitting electromagnetic radiation without absorption, respectively, said electro-optical glazing comprising:

an electro-optical glazing panel of laminated construction, having first and second optical states of operation; and

optical state switching means for switching said electro-optical glazing panel to said first optical state of operation in order to induce said electro-optical glazing panel into said total-reflection mode of operation, and for switching said electro-optical glazing panel to said second optical state of operation in order to induce said electro-optical glazing panel into said total-transmission mode of operation,

wherein electromagnetic radiation within a first prespecified bandwidth falling incident upon said electro-optical glazing panel is totally reflected from said electro-optical glazing panel without absorption when said electro-optical glazing panel is switched to said first optical state of operation,

wherein electromagnetic radiation within a second prespecified bandwidth falling incident upon said electro-optical glazing panel is totally transmitted through said electro-optical glazing panel without absorption when said electro-optical glazing panel is switched to said second optical state of operation; and.

wherein said electro-optical glazing panel comprises a first electrically-active cholesteric liquid crystal (CLC) electromagnetic radiation polarizing panel; a second electrically-active CLC electromagnetic radiation polarizing panel; and an electrically-passive π-phase retardation panel interposed between said first and second electrically-active CLC electromagnetic radiation polarizing panels.

69. The electro-optical glazing structure of claim 68, wherein said first prespecified bandwidth comprises the infrared (IR) portion and ultra-violet (UV) portions of the electromagnetic spectrum, and said second prespecified bandwidth comprises said IR portion, said UV portion and the visible portion of the electromagnetic spectrum.

79. An intelligent pair of sunglasses, comprising:

a frame; and

a pair of optical element supported within said frame,

wherein each said optical element is realized using said electro-optical glazing structure of claim 1.

102. An electro-optical glazing structure having reflection and transmission modes of operation for selectively reflecting and transmitting electromagnetic radiation, respectively, said electro-optical glazing structure comprising:

an electro-optical glazing panel of laminated construction, having first and second optical states of operation; and

optical state switching means for switching said electro-optical glazing panel to said first optical state of operation in order to induce said electro-optical glazing structure into said reflection mode of operation, and for switching said electro-optical glazing panel to said second optical state of operation in order to induce said electro-optical glazing structure into said transmission mode of operation,

wherein said electro-optical glazing panel comprises

a first electrically-active cholesteric liquid crystal (CLC) electromagnetic radiation polarizing panel;

a second electrically-active CLC electromagnetic radiation polarizing panel; and

an electrically-passive π-phase retardation panel interposed between said first and second electrically-active CLC electromagnetic radiation polarizing panels.

103. The electro-optical glazing structure of claim 102, wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels reflect electromagnetic radiation having a first circularly polarized state when said electro-optical glazing panel is switched to said first optical state of operation,

wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels transmit electromagnetic radiation having a second circularly polarized state when said electro-optical glazing panel is switched to said first optical state of operation; and

wherein said first and second electrically-passive CLC electromagnetic radiation polarizing panels reflect or transmit without absorption electromagnetic radiation having either said first state or said second state when said electro-optical glazing panel is switched to said second optical state of operation.

104. The electro-optical glazing structure of claim 102, which further comprises:

a window frame for mounting said electro-optical glazing panel within a house or office building, or aboard a transportation vehicle.

105. The electro-optical glazing structure of claim 104, which further comprises:

a electromagnetic-sensor mounted on said window frame, for sensing electromagnetic conditions;

a battery supply mounted within said window frame, for providing electrical power;

a electromagnetic-powered battery recharger mounted within said window frame, for recharging the battery;

electrical circuitry mounted within said window frame, for producing glazing control voltages for switching said first and second optical states of operation; and

a programmable micro-computer chip mounted within said window frame, for controlling the operation of said battery recharger and said electrical circuitry, and the production of said glazing control voltages as required by a radiation flow control program stored within said programmable microcontroller.

106. A composite electro-optical glazing structure which comprises:

a plurality of said electro-optical glazing structures of claim 102, stacked together as a composite electro-optical structure,

wherein said composite electro-optical structure has more than two said optical states of operation.

107. The electro-optical glazing structure of claim 102, wherein the transmission of the visible portion of the electromagnetic spectrum is controlled and wherein the IR portion of the electromagnetic spectrum is reflected.

108. The electro-optic glazing structure of claim 102, further comprising:

a reflecting layer for reflecting infrared light, wherein the electro-optic glazing structure of claim 1 controls the transmission and reflection of visible light.

109. The electro-optic glazing structure of claim 102, further comprising:

a reflecting layer for reflecting UV light, wherein the electro-optic glazing structure of claim 1 controls the transmission and reflection of visible light.

110. The electro-optic glazing structure of claim 102, further comprising:

a electro-optic glazing structure which controls the transmission and reflection of IR light, wherein the electro-optic glazing structure of claim 1 separately controls the transmission and reflection of visible light.

111. (Previously Amended) The electro-optic glazing structure of claim 102, further comprising:

a electro-optic glazing structure which controls the transmission and reflection of visible light, wherein the electro-optic glazing structure of claim 102 separately controls the transmission and reflection of IR light.

112. An intelligent pair of sunglasses, comprising:

a frame; and

a pair of optical element supported within said frame,

wherein each said optical element is realized using said electro-optical glazing structure of claim 102.